# THE LUPTON
## FIRE-PROOF
## HOLLOW-METAL
# WINDOW

DAVID LUPTON'S SONS COMPANY
PHILADELPHIA
NEW YORK DETROIT

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## David Lupton's Sons Company

Established 1871

General Offices and Works:
PHILADELPHIA

NEW YORK: 220 Broadway    DETROIT: 1315 Third Avenue

◆

# The Lupton Fire-proof Window

◆

The Lupton Architectural and Ornamental
Sheet-metal Work

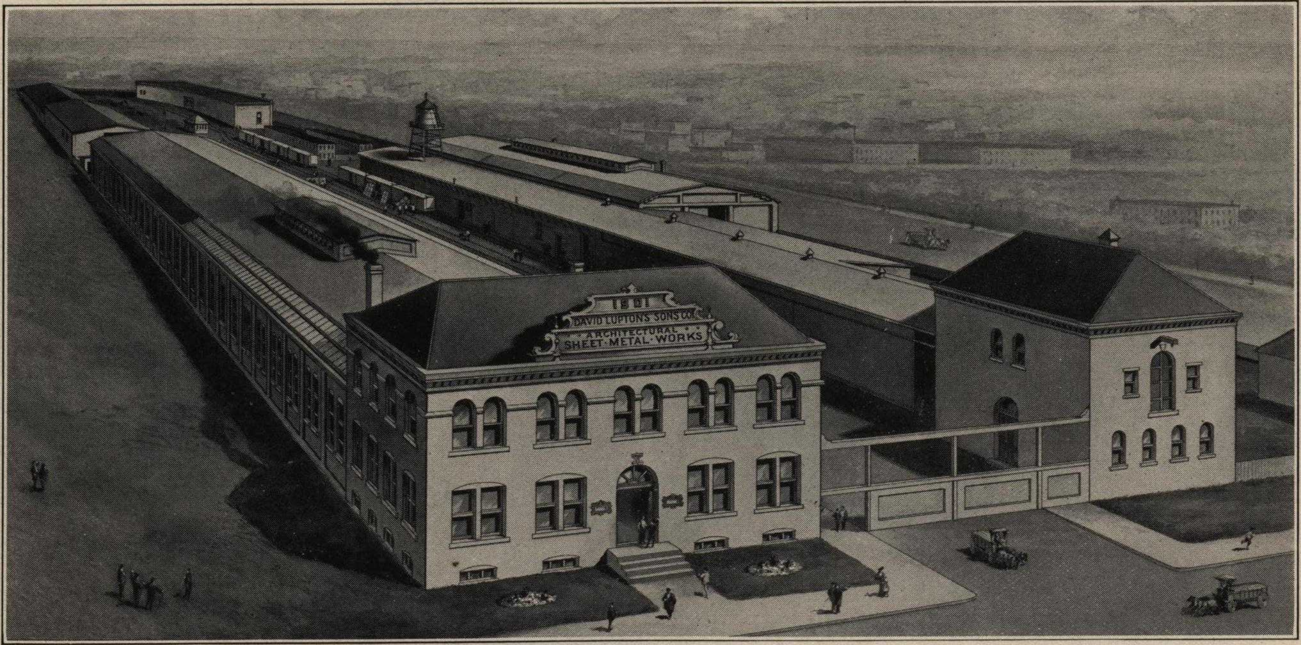
◆

The Lupton Skylights and
Skylight Gearing

◆

The Lupton Eaves-trough and Conductor-pipe,
with fixtures and trimmings

*Catalogs sent on request*



The Lupton Works occupy a full city-block, at Allegheny Avenue and Tulip Street, Philadelphia.
Ground area, 323,400 square feet.

# The plant that delivers the goods

The factory behind THE LUPTON WINDOW is the largest architectural sheet-metal works in America.

It is equipped with larger, heavier and more powerful sheet-metal-working machines and tools,—and with more of them,—than any other plant of the kind.

The Lupton facilities are absolutely complete—from draughting department and modeling rooms to railroad sidings; as may be seen from the photogravures throughout this book: Including even such auxiliaries as an independent gas-generating plant for supplying the numerous forges.

Moreover, the Lupton shops are built to provide workers with abundant daylight and fresh air.

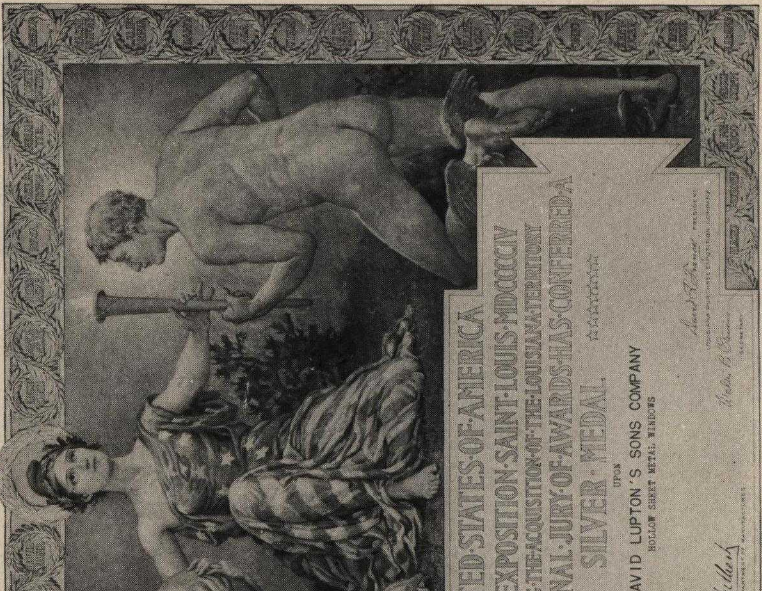
An equipment and surroundings conducive to highest-class workmanship.

Back of it all is the invaluable cumulative experience of two generations of experts in architectural sheet-metal work.

This, in a nutshell, is the reason for Lupton window superiority; the reason why Lupton architectural sheet-metal work is *standard*.

David Lupton's Sons Company

New York Philadelphia Detroit



UNITED·STATES·OF·AMERICA
UNIVERSAL·EXPOSITION·SAINT·LOUIS·MDCCCCIV
COMMEMORATING·THE·ACQUISITION·OF·THE·LOUISIANA·TERRITORY
THE·INTERNATIONAL·JURY·OF·AWARDS·HAS·CONFERRED·A
SILVER MEDAL
UPON
DAVID LUPTON'S SONS COMPANY
HOLLOW SHEET METAL WINDOWS

DIRECTOR OF EXHIBITS
CHIEF DEPARTMENT OF MANUFACTURES
PRESIDENT
LOUISIANA PURCHASE EXPOSITION COMPANY
SECRETARY

THE LUPTON WINDOW received the highest award of the Louisiana Purchase Exposition in 1904.

From a special report on the Baltimore fire, by the National Fire Protection Association:

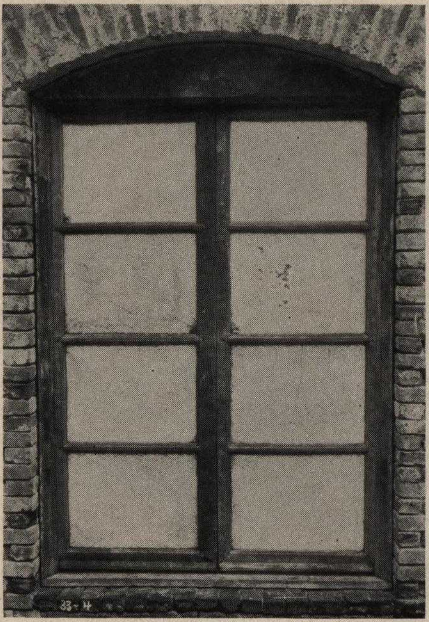
> "Buildings of fire-resistive construction but having numerous unprotected windows do not serve positively in retarding the spread of a conflagration.
>
> "The general absence of protection at exposed wall openings is responsible for the spread of the Baltimore fire * * * is the cause for the spread of this fire beyond control.
>
> "This conflagration has again demonstrated that, where subjected to exposing fire, the most vulnerable parts, in buildings of fire-resistive construction, are the window and wall openings. The necessity for making all these openings as nearly *equal in fire-resistive properties* to the other features of the building, as is possible, will be apparent."

The necessity for *universal* window protection, —as emphasized at Baltimore, then at Rochester, again at Toronto, and still again in the San Francisco disaster, is most successfully met with

## The Lupton Fire-proof Window

# The Lupton Fire-proof Window

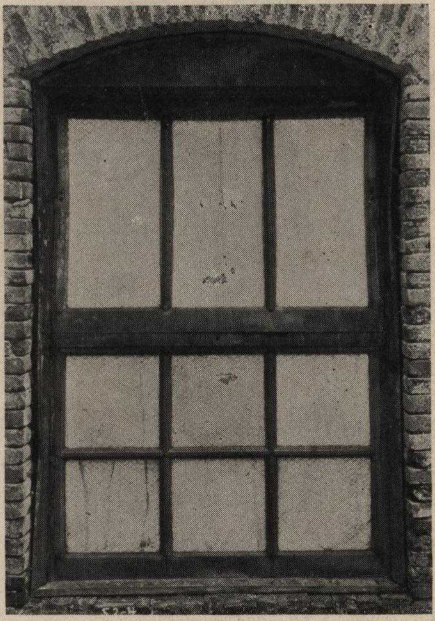
is regularly tested, in its various forms, by the Underwriters' Laboratories, Inc., and is *approved for use* by the National Board of Fire Underwriters and the National Fire Protection Association.



The Lupton Window. Type J—*Casement*
After an hour's fire-test at 1455°

The windows here shown were subjected to direct flames at 1455° Fah., and 1475° Fah., respectively, for one hour. Moreover, a seven-eighths stream of cold water, sixty pounds pressure at nozzle, was turned on the glowing windows when withdrawn from the combustion chamber.

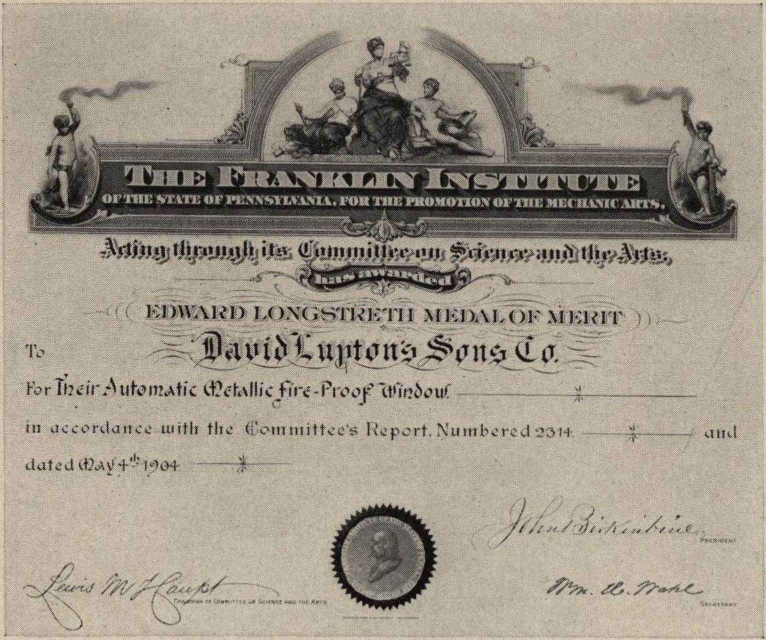
The severity of the Underwriters' tests will be better appreciated by considering that the maximum temperature in the fire, during the Baltimore conflagration, was approximately three hundred degrees *lower* than the temperatures here quoted.



The Lupton Window. Type G
After an hour's test at 1475°

By authority of the Underwriters' Laboratories, Inc., Lupton windows carry these labels:

| | |
|---|---|
| Window Frame<br>For Wired Glass<br>Constructed under the supervision of<br>Underwriters' Laboratories, Inc. | Lupton A 07<br>Manufactured by<br>David Lupton's Sons Company<br>Philadelphia |



THE FRANKLIN INSTITUTE
OF THE STATE OF PENNSYLVANIA, FOR THE PROMOTION OF THE MECHANIC ARTS,

Acting through its Committee on Science and the Arts,
has awarded

EDWARD LONGSTRETH MEDAL OF MERIT

To David Lupton's Sons Co.

For Their Automatic Metallic Fire-Proof Window

in accordance with the Committee's Report, Numbered 2314 and

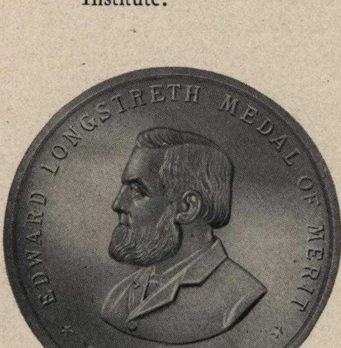
dated May 4th 1904

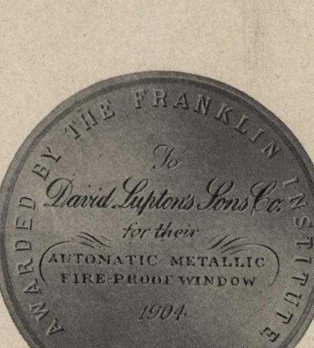
John Birkinbine
President

Lewis M. Haupt
Chairman of Committee on Science and the Arts

Wm. H. Wahl
Secretary

The Franklin Institute's awards are based on investigations conducted by experts of unquestioned authority. Therefore, more than usual importance is attached to the possession of the Longstreth Medal, awarded by the Franklin Institute.




AWARDED BY THE FRANKLIN INSTITUTE
To
David Lupton's Sons Co.
for their
AUTOMATIC METALLIC FIRE-PROOF WINDOW
1904

# The Lupton Fire-proof Window

Hollow sheet metal     Glazed with wired glass

## Standard Types

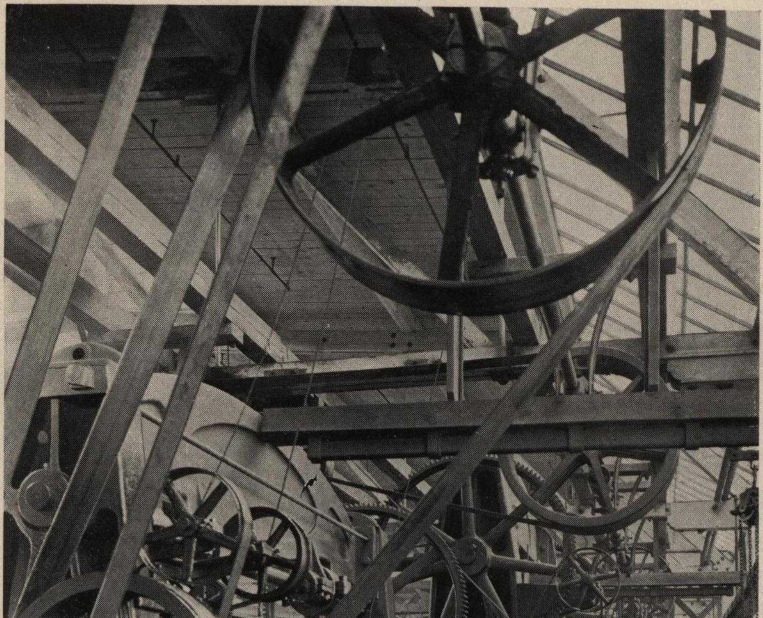
TYPE *A* —Double hung, non-reversible sashes X
TYPE *B* —Double hung, *reversible* sashes ✓
TYPE *C* —Self-balanced sashes—one hung on the other ✓
TYPE *F* —Stationary sash ✓
TYPE *G* —Stationary lower, pivoted upper sash ✓
TYPE *H* —Pivoted lower, stationary upper sash ✓
TYPE *I* —Pivoted upper and pivoted lower sashes ✓
TYPE *J* —Casement sashes hinged to swing in ✓
TYPE *J2* —Casement sashes hinged to swing out ✓
TYPE *K* —Hinged at side to open in X
TYPE *K2* —Hinged at side to open out X
TYPE *K3* —Hinged at sill to open in X
TYPE *K4* —Hinged at head to open in X
TYPE *K5* —Hinged at head to open out X
TYPE *L* —Single pivoted sash ✓
TYPE *M* —Single vertically pivoted sash X

The principles of construction of THE LUPTON WINDOW are applicable to any window anywhere in any building; exterior or partition walls.

Patented and manufactured by

David Lupton's Sons Company

New York     Philadelphia     Detroit



The Lupton Works has twice as many sheet-metal forming presses as the next largest plant; and larger, heavier presses than any other plant.

# Extra-weight metal in frames

Heavier metal is used in THE LUPTON WINDOW than is generally employed in the making of sheet-metal windows. THE LUPTON WINDOW can be depended on to stand up under conditions of unexpected severity.

Rules and Requirements of the National Board of Fire Underwriters provide that metal is to be "of at least No. 24 gauge."

Lupton window-frames are No. 22 gauge galvanized steel.* Sashes No. 24 gauge. No other window has metal heavier than No. 24 gauge for frames, unless especially provided for in specifications. For many windows even No. 26 gauge is used for frames, the Underwriters' rules to the contrary notwithstanding.

No. 24 gauge may prove to be sufficient, but there can be no doubt as to the all-sufficiency of No. 22 gauge. In THE LUPTON WINDOW assurance is made doubly sure by the use of the heavier metal.

Why is it that other window manufacturers adopt the "least" standard of the Underwriters, or even go lighter, in weight of metal?

Why is it that every other window, unless especially specified, is below the Lupton standard?

Because no other plant is so well equipped to work the heavy metal used in Lupton window-frames.

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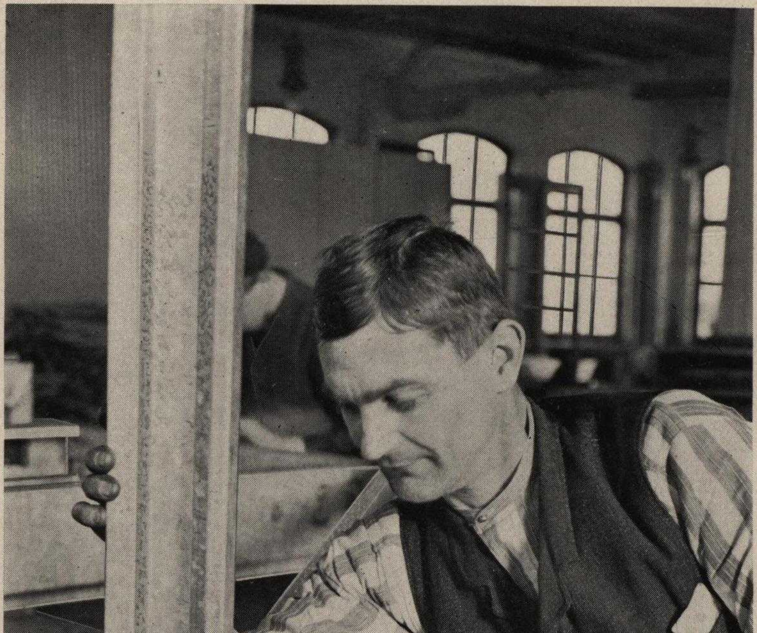
*THE LUPTON WINDOW is also made of copper, copper-coated steel, aluminum-coated steel when specified.



Joining metal window-frames by dovetailed clinches—a method of construction peculiar to THE LUPTON WINDOW.

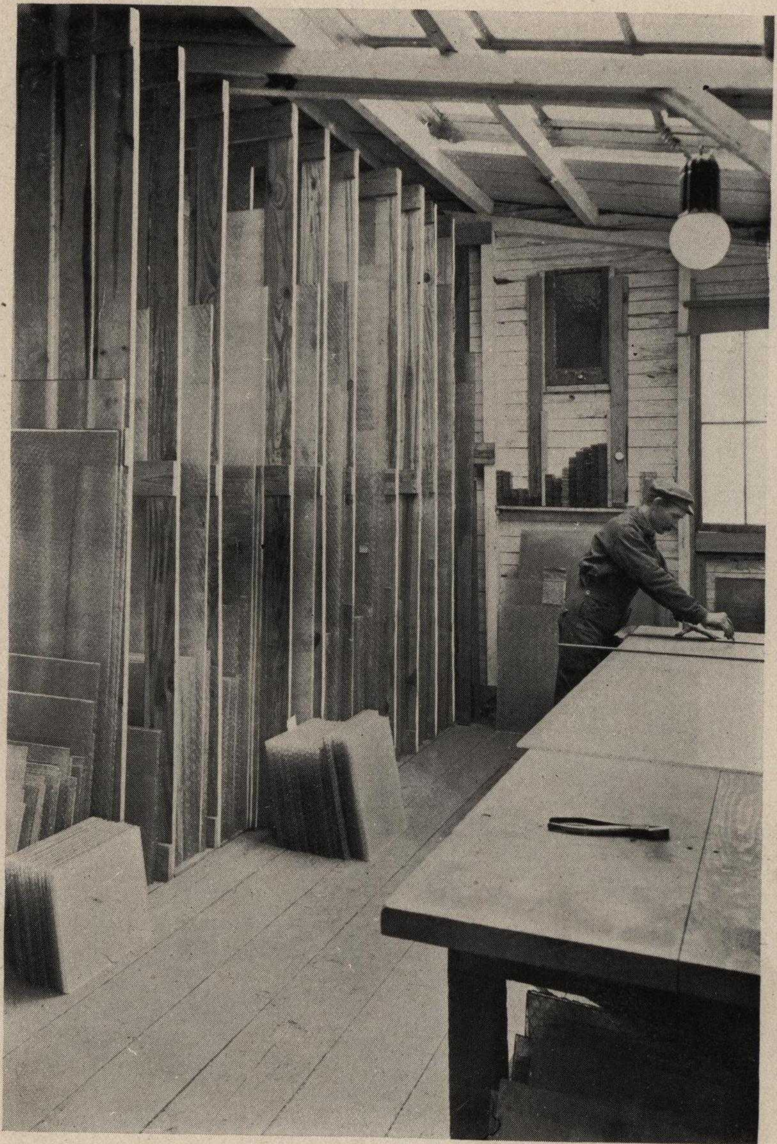
# Superior joining of frames

Not only is heavier metal a distinguishing feature of Lupton window-frames, but the Lupton method of joining sheet-metal frames is special and exclusive. Even if the Lupton standard of No. 22 gauge metal were specified and windows made accordingly, yet the frames if joined by any other method would be inferior.

A Lupton window-frame proper is four pieces of sheet metal. The head of the frame is one piece. Each jamb is a single piece. The sill is one piece. These parts are put together—*not with rivets*, but by the Lupton system of joining by dovetail clinches. Each part is made with tenons and mortises. The tenons are fitted into the mortises and clinched. As each of the joining parts has both tenons and mortises the result is a re-enforcement of construction.

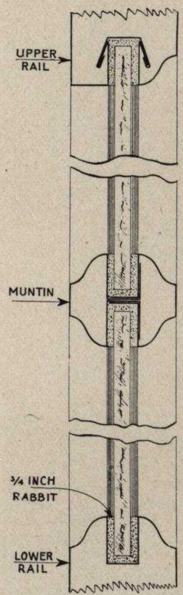
From an assurance standpoint, Lupton window-frame construction has an important value. Since the frame is practically a unit of metal of the same density, contraction and expansion are equal. By no possibility will any Lupton frame come apart under the influence of extraordinary temperatures.

Experiments have proved conclusively that rivets, used to form mitres, unbutton when metal window-frames are subjected to contraction and expansion by fire and water.



The Lupton Works has in its "glass house" at all times a larger reserve stock of wired glass—polished, ribbed, prism and mazed—than is carried anywhere else except by the glass-makers. A precaution against delays.

# Lupton sashes and glazing



Along with heavier metal and special joining in frames, The Lupton Window has superior sash construction and glazing.

Sash-mitres are made by the Lupton exclusive method of tenons fitted into mortises and clinched. Muntins are formed of two identical pieces, interlocked, and presenting the same appearance both sides. Removable top and bottom sash-caps, provided to facilitate glazing, are secured in place by turn-buckles; no solder used.

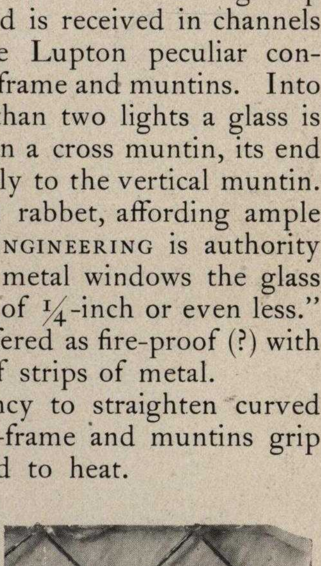
Glass is introduced down through top of sash-frame, and is received in channels produced by the Lupton peculiar construction of sash-frame and muntins. Into a sash of more than two lights a glass is inserted first, then a cross muntin, its end conforming exactly to the vertical muntin.

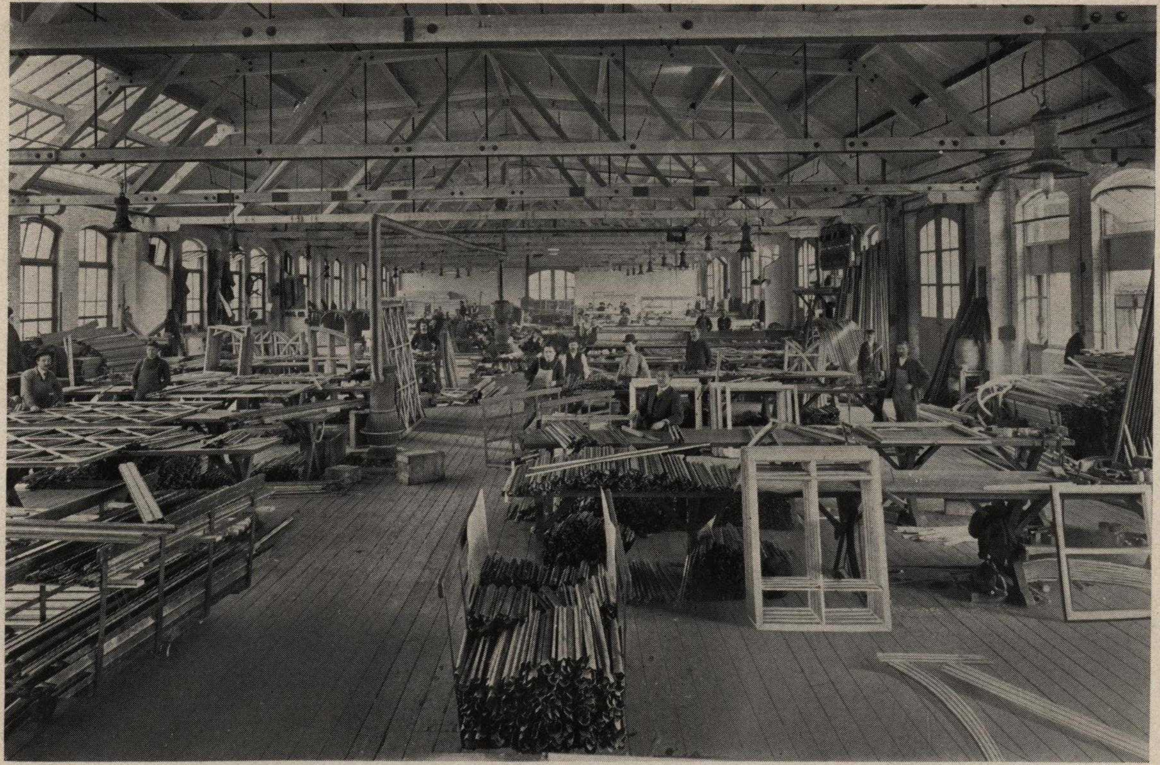
The channels form a ¾-inch rabbet, affording ample resistive qualities. Insurance Engineering is authority for the statement that "in many metal windows the glass is mounted with a bearing surface of ¼-inch or even less." It is also true that windows are offered as fire-proof (?) with the ridiculously insecure glazing of strips of metal.

Since expansion has a tendency to straighten curved surfaces, the Lupton curved sash-frame and muntins grip the glass vice-like, when subjected to heat.

The Lupton Window is glazed with ¼-inch wired glass. The glass is as secure and as much a part of the window as the sash itself, thereby affording absolute window protection.

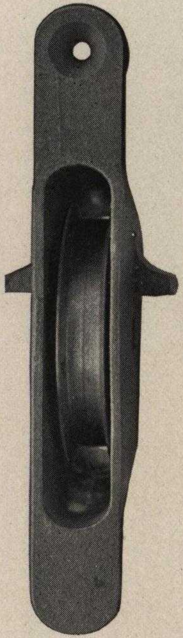
The efficacy of wired glass as a fire-stop depends on the sashes and frames supporting it. If frames are of so light-weight metal or so imperfectly made as to collapse, or sashes warp, or glazing is insecurely done, there is little advantage in wired glass.





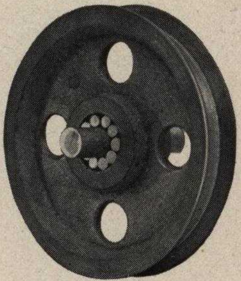
Assembling Lupton window frames and sashes

# The Lupton Pulley

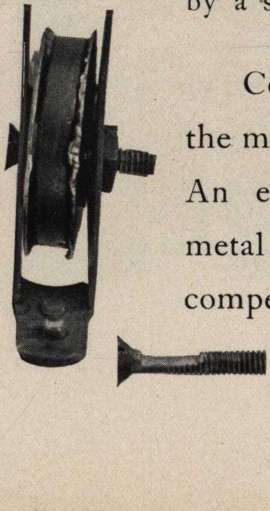


is of a special design, made expressly for THE LUPTON WINDOW. Axle and roller-bearings—of highest grade machine steel—are made in the Lupton machine shops, and pulley assembled there. Wheel and casing are of best gray iron: the wheel made with extra depth of sheave and the casing to not only protect the wheel but to prevent the chain from slipping off.

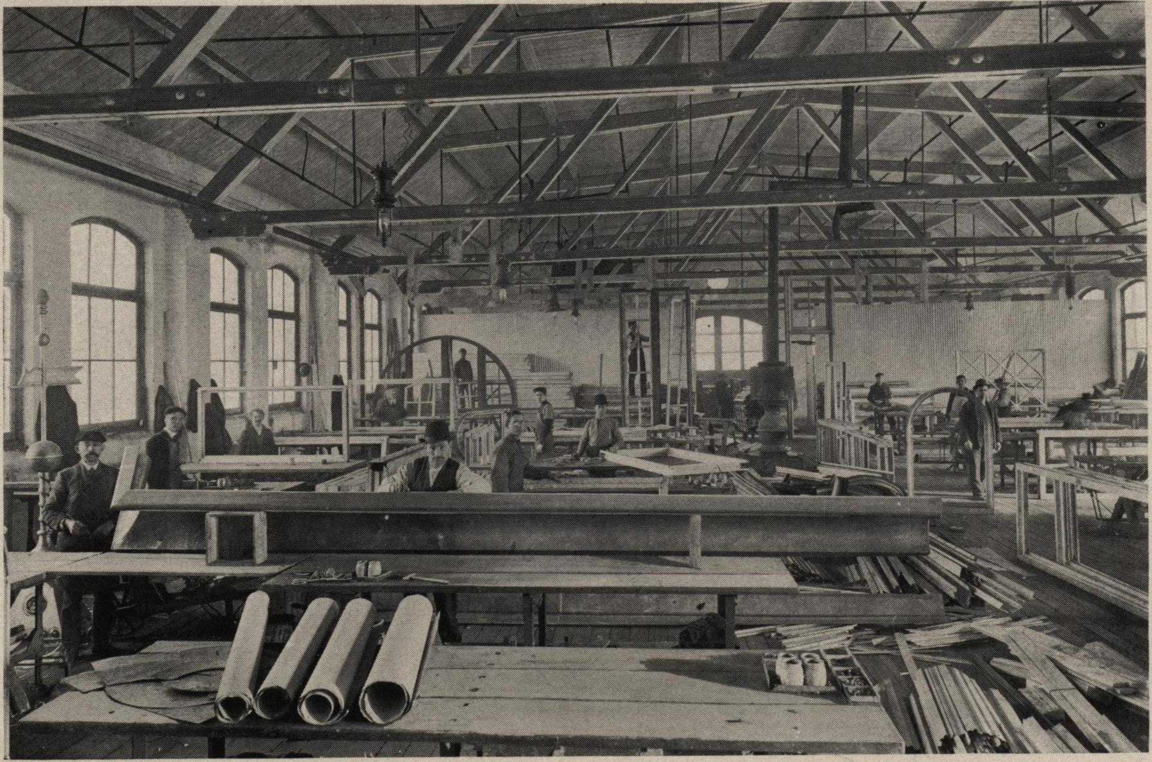
The Lupton pulley is placed directly over weight box and secured there by an improved method, special provision being made in the frame to receive the flat end, while the opposite end is fastened by a screw.



One-inch roller bearings



Contrast the Lupton pulley with the make-shift device here reproduced: An example of what was gotten in metal windows by a buyer who ignored competition on quality and awarded his window contract on price alone.



Where Lupton window-frames of unusual proportions are finished

## The hardware equipment

of The Lupton Window is thoroughly modern and of best quality.

Sash pulleys, with especially constructed one-inch roller-bearings.

Sash chains of absolute reliability, made expressly for The Lupton Window.

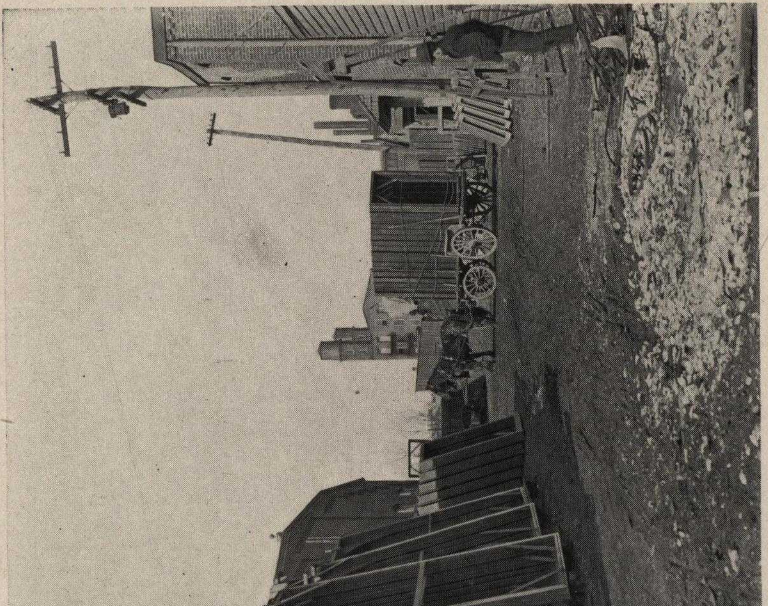
Sash weights of the most approved sectional type.

Sash locks and lifts of Underwriters' required patterns.

## The architectural appearance

presented by the standard types of The Lupton Window is strictly high-class and in harmony with modern-style structures.

Special styles of frames to conform to unusual architectural requirements made to order.

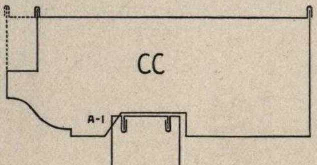


Lupton frames ready for delivery to the John Wanamaker Store (1906)

# Weather-proof qualities

should be considered, in a metal window, equally with fire-resistive properties. Fire-proofness is a matter of insurance. Weather-tightness is a question of fuel economy and personal comfort. Lack of weather-tightness is a serious fault of the average metal window.

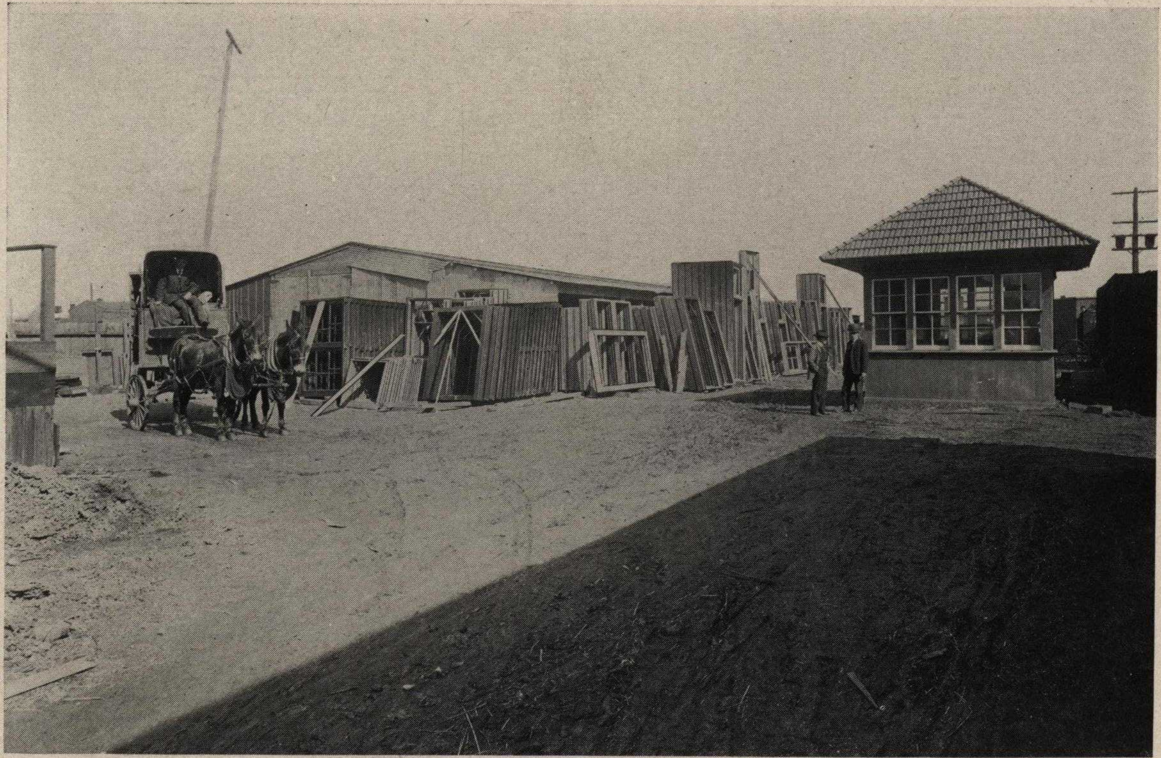
Lupton designing, together with the thoroughness of Lupton workmanship, produce a sheet-metal window as perfectly weather-tight as any window of any material can be constructed.



Lupton sashes slide freely, yet when closed are perfectly tight and non-rattling. This explains why:—

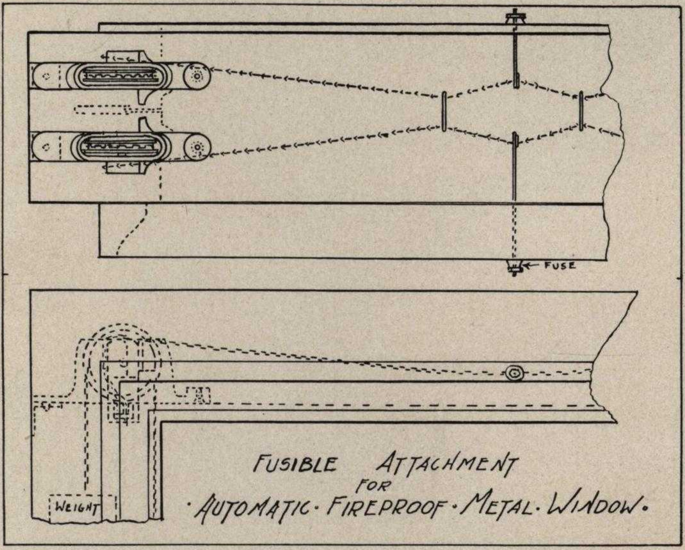
Bevel "A1" in pocket of head "CC" tightens the upper sash at the top. The meeting-rails interlock, making a wind-proof juncture, checkrail "E" drawing both sashes together and against the runways.

Bevel "A2" in sill "BB" tightens bottom sash. Moreover, these bevels, in head and sill, force both sashes firmly against the runways. Recess "D" prevents water from backing up on the sill by capillary attraction.



Lupton window-frames for a big operation awaiting delivery orders

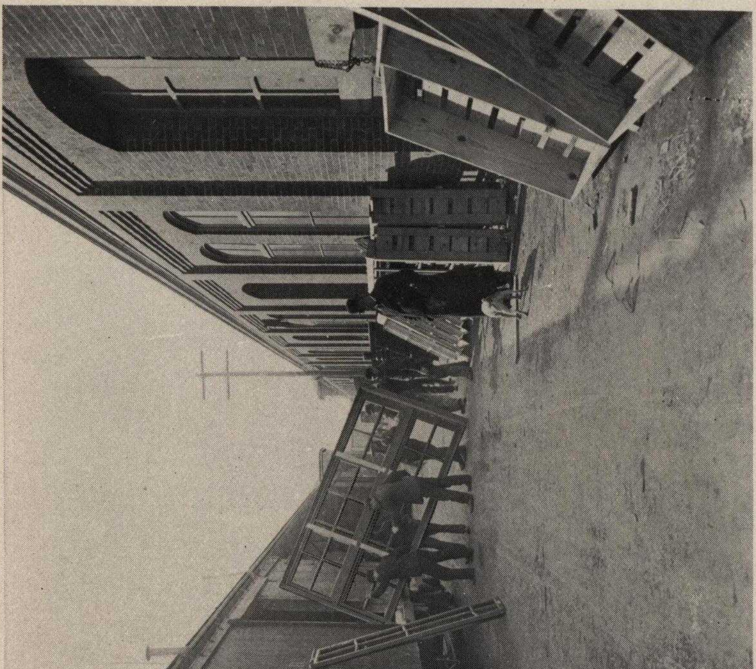
# Automatic closing sliding sashes



Sliding sashes are over and under weighted; and balanced by supporting the pulleys on saddles. Each saddle is held up by a chain tightened with a rod. The rods extend through the head and are separated by tightening nuts under which are fusible links.

At 165 degrees the link melts from under the nut, releasing chains, and the sashes close by gravity.

The sashes slide freely and close tightly. A slanting pocket at head of window, and the slanting off-set in the sill, serve, wedge-like, to tighten the entire window.



The Lupton Works has in use 700 feet of railroad sidings of its own

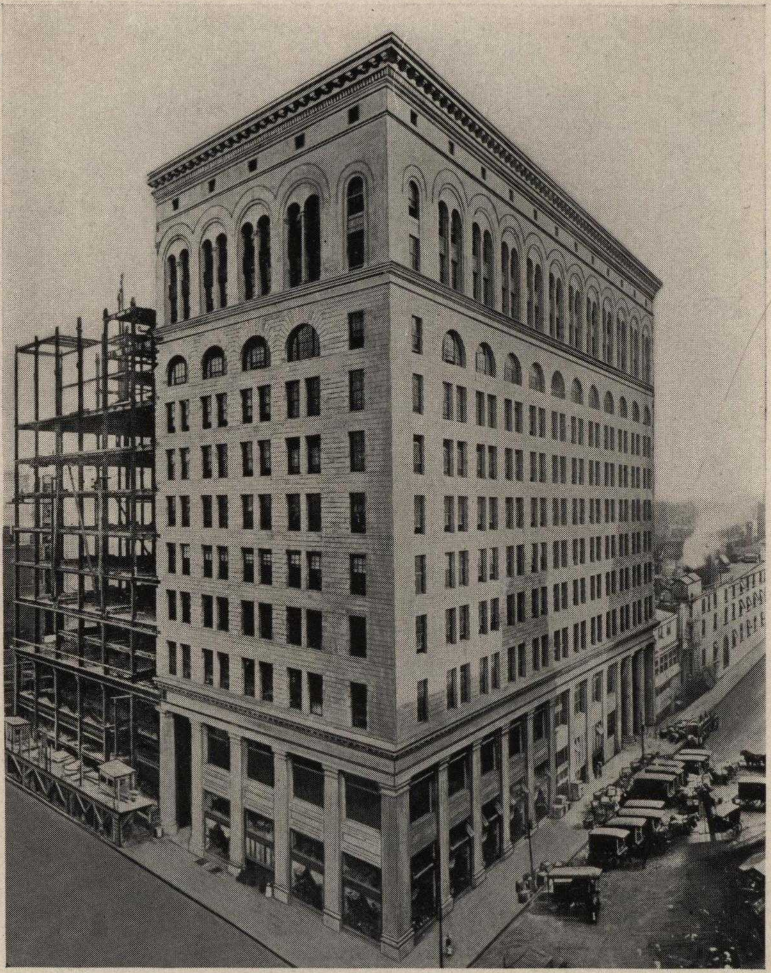
# Delivery of Windows.

While investigating metal windows, it is a wise precaution to also seek information on the factory facilities of the concerns that father them.

> Not what a factory says it can do, but what it does do — *counts.*
>
> You may write delivery dates into the contract, you may even exact a guarantee,—but, if the shop that undertakes the job does not have the facilities, you will have to *wait* on your frames.
>
> The hollow-metal window is comparatively a new thing. Some people may think that any tinsmith should be able to make frames and sashes out of sheet metal. For the matter of that, any carpenter can build a boat; but when it comes to a ship that will stand shot and shell,—that is different! And so it is with metallic windows.

THE LUPTON WINDOW factory is the largest, lightest and most completely equipped in America. Its capacity is more than equal to the heaviest demands. It *can* make better sheet-metal windows, and better deliveries, than any other window factory — *and does it!*

It has only needed an inspection of the Lupton plant to secure some of the biggest contracts ever written for metal windows.



The John Wanamaker New Department Store, Philadelphia
(One quarter finished—1906)

The finished structure will contain twenty-five hundred window openings. This building, to cost five million dollars, with its hundreds of thousands of dollars' worth of merchandise, will be protected by THE LUPTON WINDOW.

Lupton windows were first used by the John Wanamaker firm in its New York store. Sixty-five thousand square feet of window openings.

(Other installations, pages 48 to 57)

# THE LUPTON WINDOW is—

Right in principle
Practical in design
Thorough in workmanship
Correct in architectural detail
Heavier in metal used in frames
Superior in the joining of frames
Superior in construction of sash-frames and muntins
Superior in method of glazing and holding in the wired glass
Better in the kind and grade of hardware equipment
A tight window—non-rattling and weather-proof
Made dependably automatic closing when desired
Fire-proof by Underwriters' test
Approved by insurance experts
Delivered promptly

Patented and manufactured by

David Lupton's Sons Company
New York Philadelphia Detroit

Louisiana Purchase Exposition Medal

Awarded to

## THE LUPTON WINDOW

on these specific counts:

Originality of ideas

Superiority of design

Weather-tightness

Fire-proofness
when sashes are
glazed with wired glass

Practicability of
revolving
sliding sashes

Dependability of
automatic
closing device

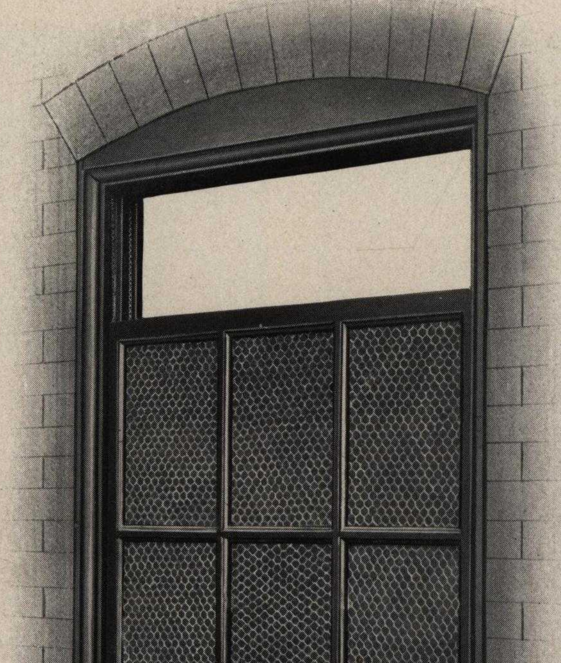
## Lupton metal window superiority

The Lupton designs in sheet-metal windows, the Lupton construction of frames and sashes, the Lupton way of putting in the wired glass, the Lupton window-hardware — are *different*. Of these differences, combined with highest-class workmanship, consist the Lupton superiority.

## Sixteen standard types

The Lupton Window is made in sixteen different styles, or variations. Those in largest general demand are illustrated and described on the pages immediately following.

In addition to the sixteen standard types, special styles on special specifications are constantly going through the factory. A larger variety of sheet-metal windows is made in The Lupton Works than in any other plant in America.



THE LUPTON WINDOW. Type A

# THE LUPTON WINDOW. Type A

Double hung, non-reversible sashes

The standard sheet-metal window most largely in use.

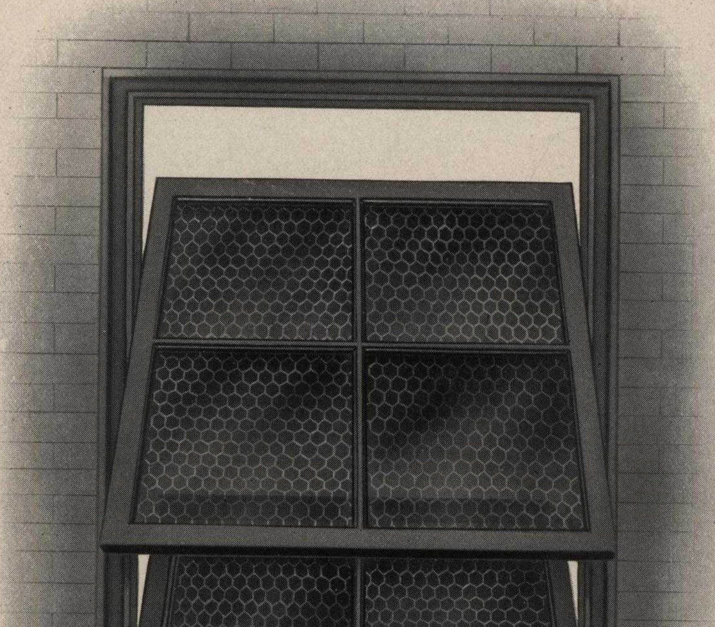
Equal in weather-tightness to a carefully built wooden window fitted with weather-strips of the most approved form.

The sash-pocket at the head of frame is made with a bevel which tightly closes the upper sash at the top and in against the runways. A similar bevel in sill tightens the lower sash there and forces it out against the runways. The meeting-rails interlock one with the other, drawing both sashes together and against the runways at that point. Thus the runways are made to form weather-strips. Construction described in detail page 19.

Jambs are constructed to permit of removal of runways for interior painting.

Type A can be equipped with automatic-closing device, as described page 21, at an advanced price.

For measuring instructions, see page 42.



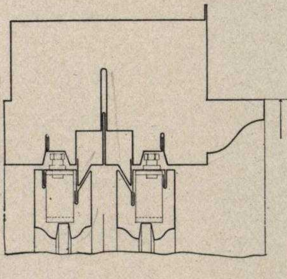
THE LUPTON WINDOW. Type B

# THE LUPTON WINDOW. Type B

Double hung, reversible sashes

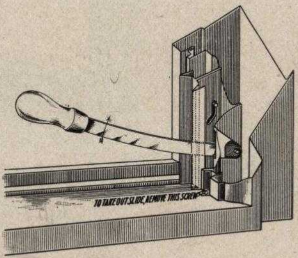
A window with sliding sashes which also *revolve:* the first and only metal window in which the sliding-and-revolving-sash idea is developed in an altogether practical and always workable way,—without impairment of weather-tightness or fire-proofness.

Revolving sashes simplify window cleaning; they do away with the danger attendant on cleaning windows from the outside, and, at the same time, with the necessity of employing men experts to do it.



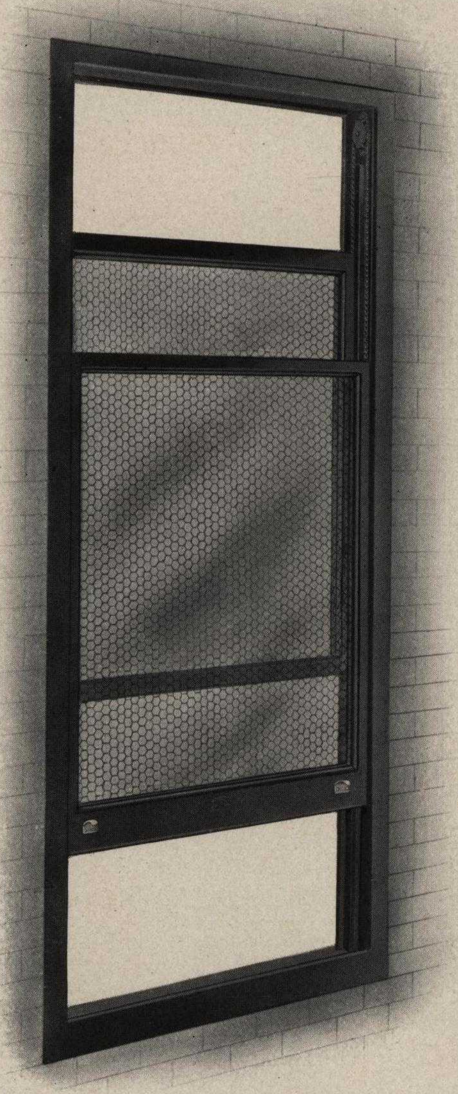
The revolving operation is simple: The sashes run on movable stiles. The stiles are provided with half-angular, half-vertical slots, and are guided by pins introduced through these slots (see illustrations). Upward motion of the lever moves the stiles back into jambs, allowing freedom for sashes to be revolved in either direction. Downward motion of the lever brings stiles forward and slots into position, with pins in vertical part. The stiles cannot be forced back or sashes revolved—except by use of the lever. Sash-chains end in special shoes, with tapering slots, receiving and securely holding the studs on which sashes revolve. No springs are used.

The stiles are placed in jambs, removable for installing weights or interior painting.



Type B can be equipped with automatic-closing device, as described on page 21, at an advanced price.

For measuring instructions, see page 43.



THE LUPTON WINDOW. Type C

# THE LUPTON WINDOW. Type C

Self-balanced sashes

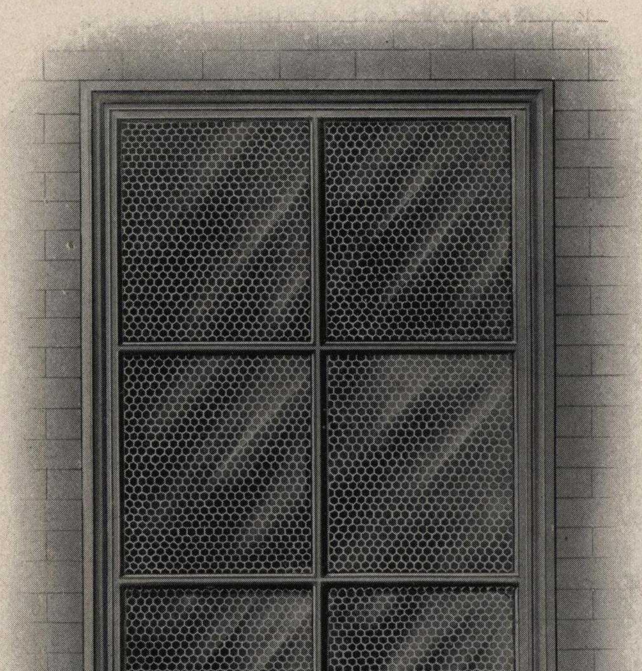
The sashes are hung one upon the other and move up and down at a common impulse.

This form of sliding-sash window, being less costly to produce, is desirable in operations where economy is an important consideration. It is employed to advantage especially in foundries, dyehouses and factories where ventilation is wanted top and bottom of the window-opening.

Type C has the same weather-proofing features referred to in connection with Type A, and shown in detail on page 19.

Type C can be made automatic-closing at an advanced price.

For measuring instructions, see page 44

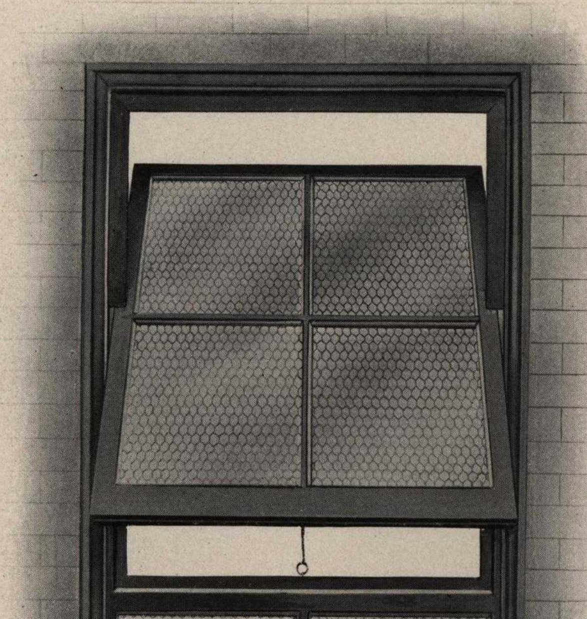


The Lupton Window. Type F

# THE LUPTON WINDOW. Type F

Stationary sash

A sheet-metal window designed for warehouses, factories, mills and other large buildings in which it is desirable or imperative to have window-openings permanently closed. A silk mill where a cold draught on the looms in operation would possibly injure the fabric, is a case in point.



THE LUPTON WINDOW. Type G

# THE LUPTON WINDOW. Type G

Stationary lower, pivoted upper sash

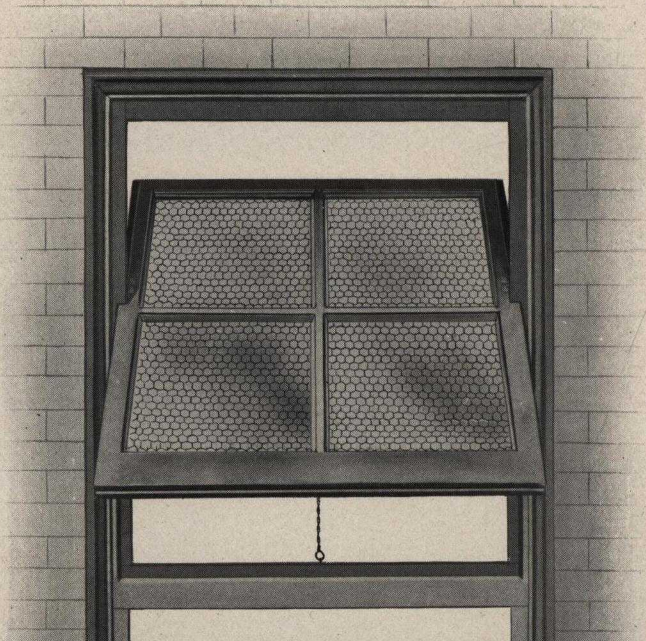
The illustration of Type G will serve also for Type H—which differs only in the arrangement of the sashes, the upper being stationary and the lower pivoted.

These windows are used where it is desirable to have window ventilation, yet not necessary or desirable to open both sashes.

Observe the ample contact surfaces on all sides of the pivoted sash. These, with the recess in bottom of lower sash-rail and similar recesses in side sash-rails, make the windows wind- and rain-tight.

The sash-chain is provided with a fusible link, making the pivoted sash automatic-closing on the approach of fire.

For measuring instructions, see page 45.



The Lupton Window. Type I

# THE LUPTON WINDOW. Type I

Pivoted lower and pivoted upper sashes

A desirable and economical sheet-metal window for manufacturing plants in general. Affording the advantages of weather-proofness and automatic-closing by means of the fusible link.

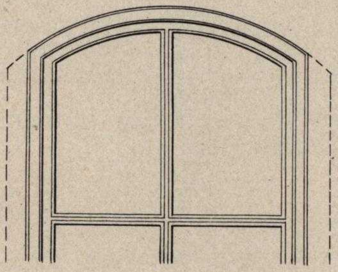
The sashes close tightly against weather strips of a full inch depth. The bottom rails of both upper and lower sashes are formed with a deep recess which prevents water working its way back. The side sash-rails are likewise recessed.

Both chains have fusible links. At a temperature of 165° the links melt and the sashes close and lock automatically. Fire outside will be retarded; or air will be kept from feeding and exciting a fire within.

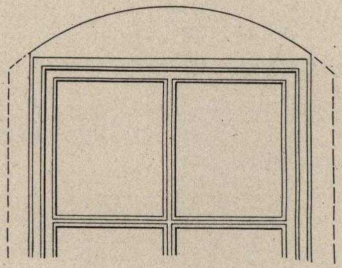
The Lupton New Sash-locking Device for horizontal pivoted sashes is thoroughly practical and reliable. Observe the points: (1) Malleable Iron. (2) So constructed that the bottom of sash is drawn tightly against sill on single pivoted and against impost on double pivoted window at the same instant that the top of sash is locked. (3) The action is positive, locking securely in both places, being mechanically correct. (4) Simple in construction, contains no springs to get out of order. (5) Locking devices applied to sashes at factory—insuring accuracy of fit.

For measuring instructions, see page 45.

# A suggestion on circular-head windows



Not this ;—



but this.

Let the plans and specifications provide for segment top *with square inside frame and sash.* Thus the desired architectural effect can be produced at lower cost than with a curved inside frame and curved sash-rail. Not only so, but the square inside finish makes a more satisfactory window.

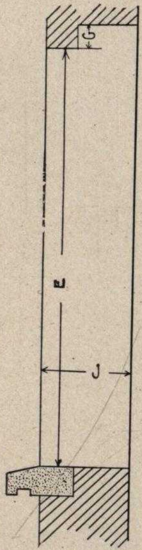
# Measurements for windows

## should be supplied as follows:

**D**—Width of clear opening in wall.
**E**—Clear height of square head opening.
**F**—Rise of arch.
**G**—Offset at the top.
**B**—Depth of reveal.
**C**—Inner edge of reveal to inner face.
**A**—Offset.
**J**—Thickness of wall.

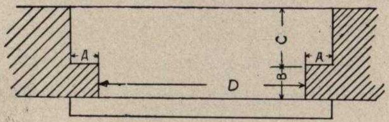
In Old Buildings, where wood windows are replaced by metal, accurate, full size sections through head, sill and sides should be given in addition to above measurements, showing any woodwork that may remain to be covered with metal.

In Any Case, where the sections of wall are not built as shown in Figs. 2-3, a full size drawing of sections should be sent.



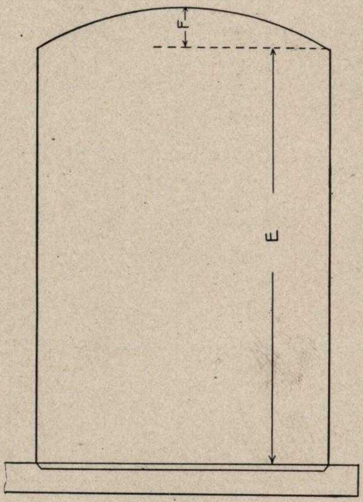
VERTICAL · SECTION

Fig. 1.
Vertical section through a square head opening.



·HORIZONTAL ·SECTION·

Fig. 2.
Horizontal section.



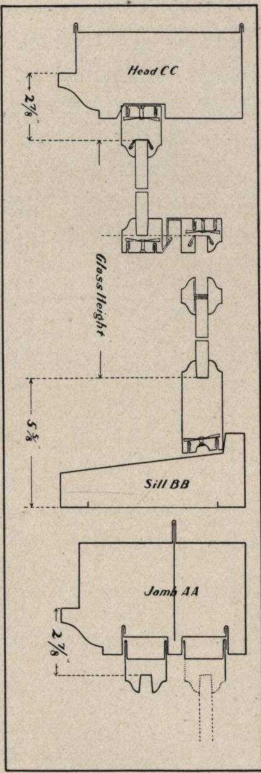
FRONT· ELEVATION·

Fig. 3.
Elevation of a circular head opening.

NOTE.— In Measuring clear openings do not measure height from outer edge of stone sill, but set rule on top of stone sill where it intersects the outer face of wall.

(Measuring instructions continued on page 42.)

# Measuring for Standard Type A Lupton Window



First, determine the out-to-out glass dimensions of window, based on the size and the number of lights desired.

Then arrive at the size of wall-opening, as follows:

*Width of Wall-Opening.*—To total glass width add 5¾ inches: this being twice 2⅞ inches, the space each side of the glass which is occupied by sash- and frame-members in this type of window.

*Height of Square-head Opening.*—To total glass height add 8½ inches: this being 2⅞ inches plus 5⅝ inches, the spaces, respectively above and below the glass, which are occupied by the sash- and frame-members in this type of window.

Thus, a Type A Lupton Window of twelve lights of a size twelve by sixteen inches, would require a wall-opening of a width 41¾ inches and a height 72½ inches.

For example: 12″ x 3 + 5¾″ = 41¾″ (width).
16″ x 4 + 8½″ = 72½″ (height).

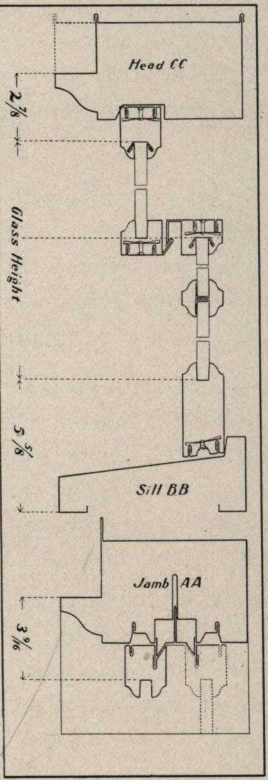
For segment head, add spring of segment to height obtained as above. The radius should be specified; in the absence of definite information it will be made to equal the width of wall-opening.

Note.—Heavier sash-rails are recommended for windows over 5 by 8 feet. To compute the opening for Type A window with the heavier sash, add 1¼ inches to the width, and 3⅜ inches to the height, as obtained above. Illustrations in this catalog are based on standard size sash-rail. The increased width and height are in excess of the standard.

# Measuring for Standard Type B Lupton Window

First, determine the out-to-out glass dimensions of window, based on the size and the number of lights desired.

Then, arrive at the size of wall-opening, as with Type A:



*Width of Wall-Opening.*—To total glass width add 7⅛ inches: this being twice 3 9-16 inches, the space each side of the glass which is occupied by sash- and frame-members in this type of window.

*Height of Square-head Opening.*—To total glass height add 8½ inches: this being 2⅞ inches plus 5⅝ inches, the spaces, respectively above and below the glass, which are occupied by the sash- and frame-members in this type of window.

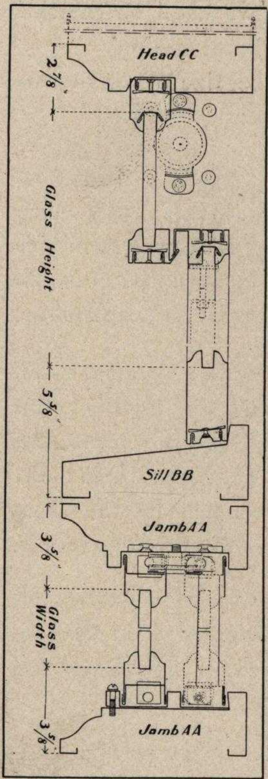
Thus, a Type B Lupton Window, following the example employed on the previous page, would require a wall-opening 43⅛ by 72½ inches.

12″ x 3 + 7⅛″ = 43⅛″ (width).
16″ x 4 + 8½″ = 72½″ (height).

For segment head, add spring of segment to height obtained as above. The radius should be specified; in the absence of definite information, it will be made to equal the width of wall-opening.

Note.—To compute the opening for Type B window with the heavier sash, recommended for windows over 5 by 8 feet, add 1¼ inches to the width, and 3⅜ inches to the height, as obtained above.

# Measuring for Standard Type C Lupton Window



First, determine the out-to-out glass dimensions of window, based on the size and the number of lights desired.

Then, arrive at the size of wall-opening, as follows:

*Width of Wall-Opening.*—To total glass width add 7¼ inches: this being twice 3⅝ inches, the space each side of the glass which is occupied by sash- and frame-members in this type of window.

*Height of Square-head Opening.*—To total glass height add 8½ inches: this being 2⅞ inches plus 5⅝ inches, the spaces, respectively above and below the glass, which are occupied by the sash- and frame-members in this type of window.

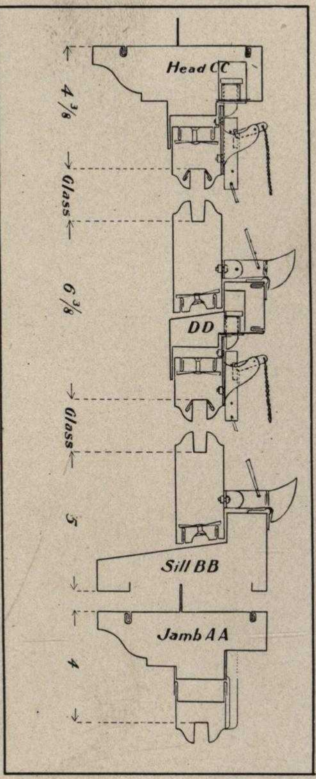
Thus, to continue the former example, a Type C Lupton Window of twelve lights of a size twelve by sixteen inches, would require a wall-opening of 43¼ by 72½ inches.

12″ x 3 + 7¼″ = 43¼″ (width).
16″ x 4 + 8½″ = 72½″ (height).

For segment head, add spring of segment to height obtained as above. The radius should be specified; in the absence of definite information, it will be made to equal the width of wall-opening.

Note.—Heavier sash-rails are recommended for windows over 5 by 8 feet. To compute the opening for Type C window with the heavier sash, add 1¼ inches to the width, and 3⅜ inches to the height, as obtained above.

# Measuring for Standard Type G, H or I Lupton Window



After determining total glass width and height, obtain the size of wall-opening, as follows:

*Width of Wall-Opening.* — To total glass width add 8 inches: this being twice 4 inches, the space each side of the glass which is occupied by sash- and frame-members in Types G, H and I.

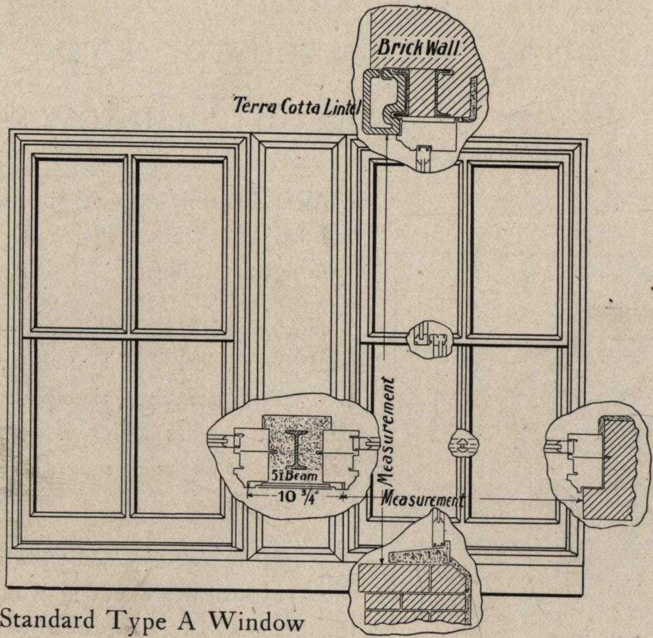
*Height of Square-head Opening.*— To total glass height add 15¾ inches: this being 4⅜ inches plus 6⅜ inches plus 5 inches, the spaces respectively above, between and below the glass, which are occupied by the sash- and frame-members in Types G, H and I.

Thus, a Type G, H or I Lupton Window of eight lights of a size twelve by sixteen inches, would require a clear wall-opening of a width 32 inches and a height 80⅜ inches.

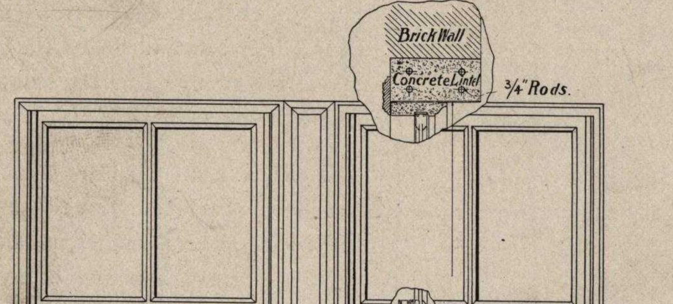
For example:
12″ x 2 + 8″ = 32″ (width).
16″ x 4 + 15¾″ = 79¾″ (height).

For segment head, add spring of segment to height obtained as above. The radius should be specified; in the absence of definite information, it will be made to equal the width of wall-opening.

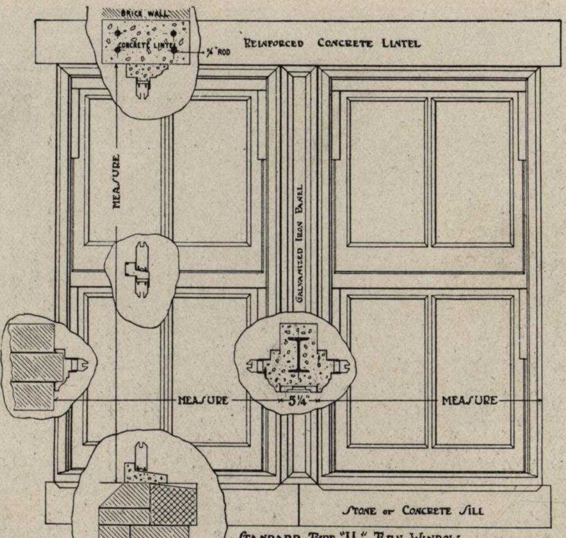
# Mullioned Windows



Standard Type A Window



Standard Type C Window



STANDARD TYPE "IL" TWIN WINDOW

Mullioned Windows should be constructed strictly in accordance with the Underwriters' requirements: *Rule 19.—Mullioned Windows* (Adopted May, 1906).

*a.* Where openings are in excess of 5 by 9 feet, the metal frames containing the sash or glass to be reinforced at every point of division by I beams thoroughly protected by approved fire-proofing.

*b.* I beams to be securely fastened into the brickwork, proper allowance being made for expansion of the beams when heated.

In new buildings the reinforcing members should be installed as the building is erected.

*c.* The depth of the I beam to be not less than 5 inches. This should be increased where the openings are in excess of 9 feet.

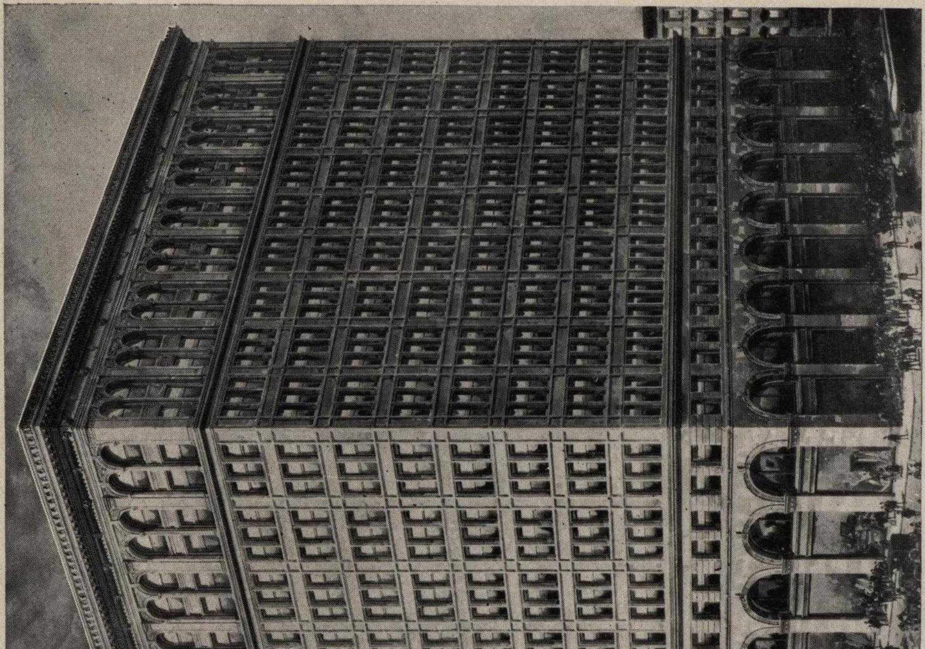
*d.* I beam to be provided with at least 2 inches of tile, concrete or other approved material on the flanges and at least 2½ inches next to the web. The amount of fire-proofing next to the web should be increased on large beams.

*e.* Metal frames to be securely attached to the reinforcing members.

In most cases the reinforcing members should be thoroughly enclosed by the metal parts of the frames, care being taken to rivet or otherwise fasten the parts at points of junction so as to resist fire. Purely ornamental parts may be fastened by soldering.

The drawings show the correct installation of frames and mullions. Mullioned construction is not a part of the windows. The reinforcing members should be installed as the building is erected.

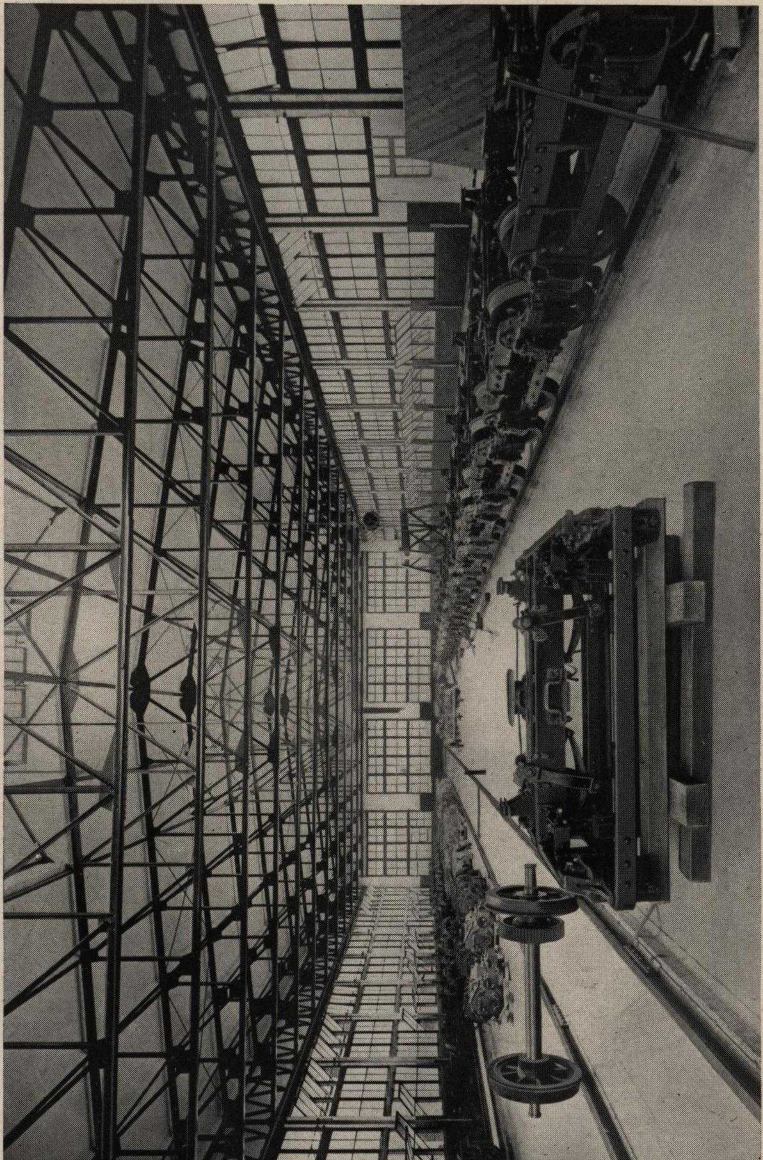
We advocate the use of single openings rather than mullioned windows.



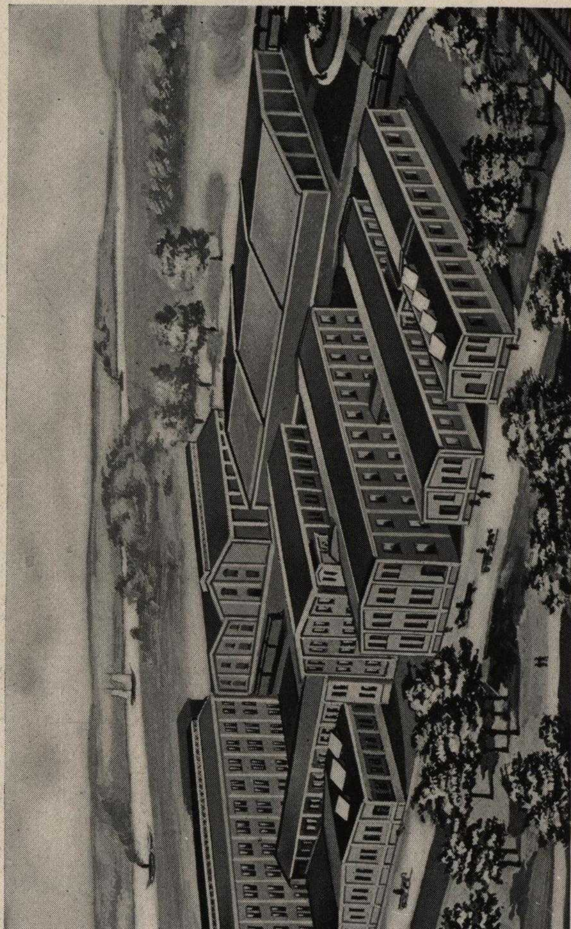
The John Wanamaker New Department Store, New York

Architects: D. H. Burnham & Co., Chicago Superintendent: Wm. C. Haddock, Philadelphia

1880 Lupton Windows



Philadelphia Rapid Transit Co.'s new car barn at Sixty-ninth and Market Streets, the Elevated Terminal, showing Lupton Windows of great size



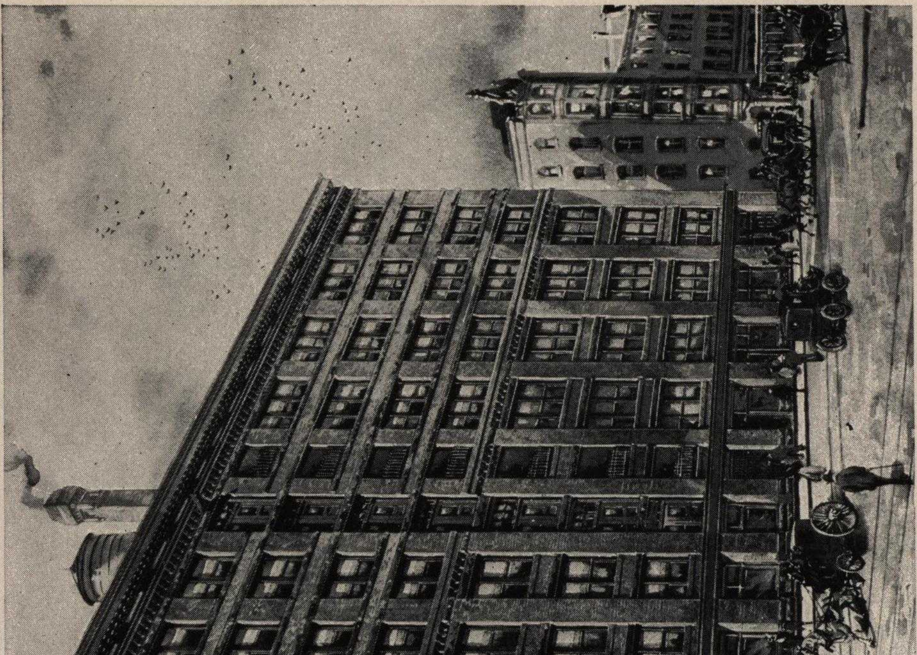
The Babbitt Plant, at Granton, N. J.

All architectural metal work in this enormous plant was done by David Lupton's Sons Company, including Lupton fire-proof hollow-metal Windows and Lupton skylights.

Security Building, Bridgeport, Conn.

Window-opening protected by The Lupton fire-proof hollow-metal Windows.

| | |
|---|---|
| 416 double-hung windows, | 5883 square feet |
| 28 pivoted windows, | 944 square feet |
| 14 stationary windows, | 137 square feet |
| 1 self-balanced window, | 15 square feet |



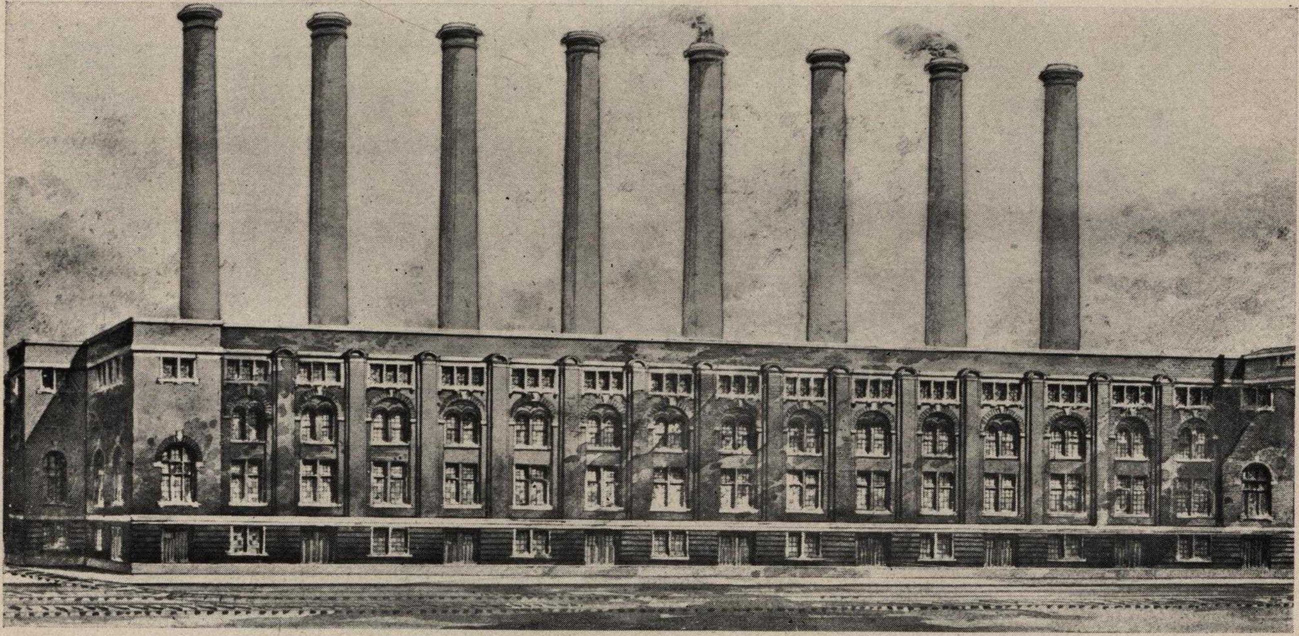
**Ballinger & Perrot**, Architects, Philadelphia

The Ketterlinus Building, Philadelphia

Window-opening protected from fire by The Lupton fire-proof hollow-metal Window

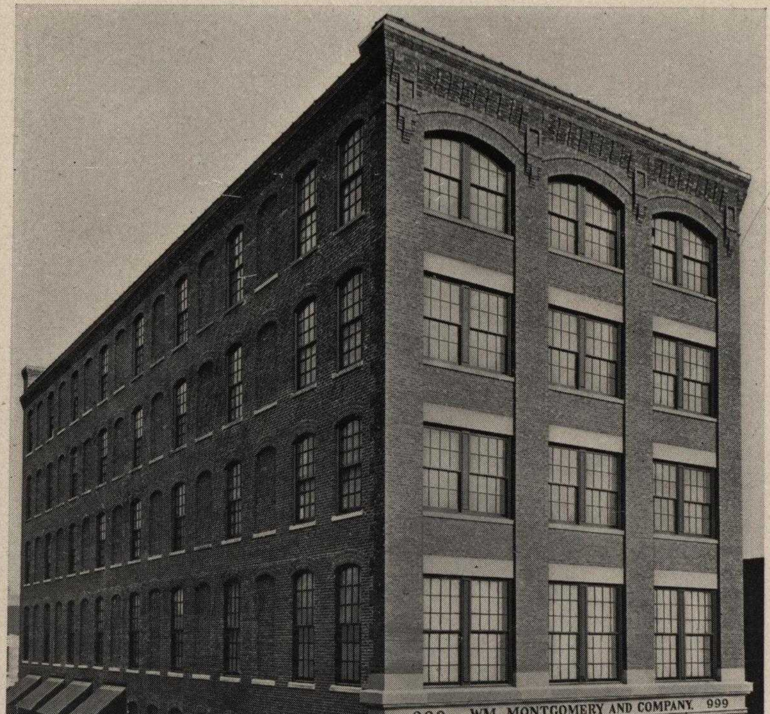
119 double-hung windows, 5027 square feet 6 bulk windows, . . . . 633 square feet

18 pivoted windows, . . 637 square feet 2 bulk windows, with door, 339 square feet



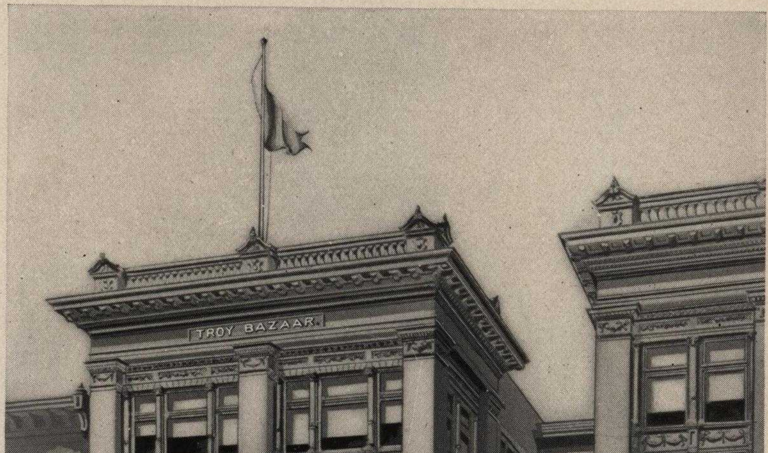
TWINING-HEATH, Architects

Philadelphia Rapid Transit Co. Power House, Delaware Avenue and Poplar Street, Philadelphia
Largest of its kind in Philadelphia when completed.



Wm. Montgomery & Co.'s building, Philadelphia.

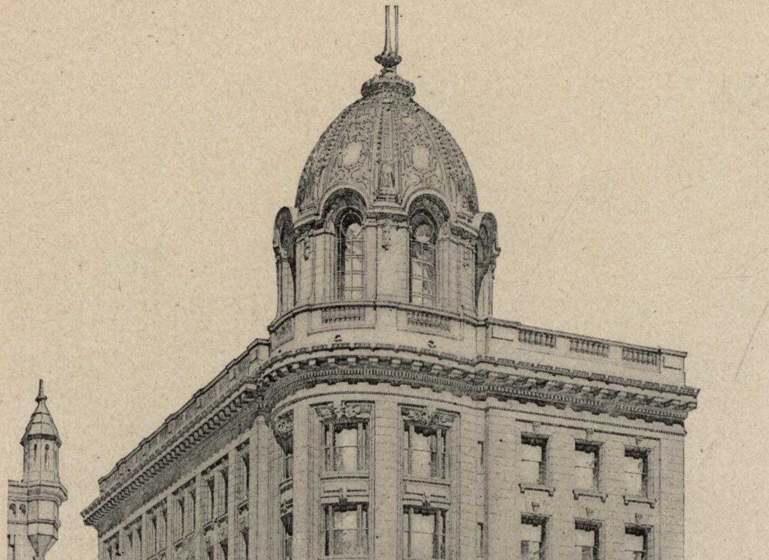
A large wholesale grocery house which shows the utility of The Lupton Window for large warehouses.



FIELD, HINTCHMAN & SMITH, Architects, Detroit, Mich. JOHN H. LEE, Builder, Troy, N. Y.

Troy Bazaar, Troy.

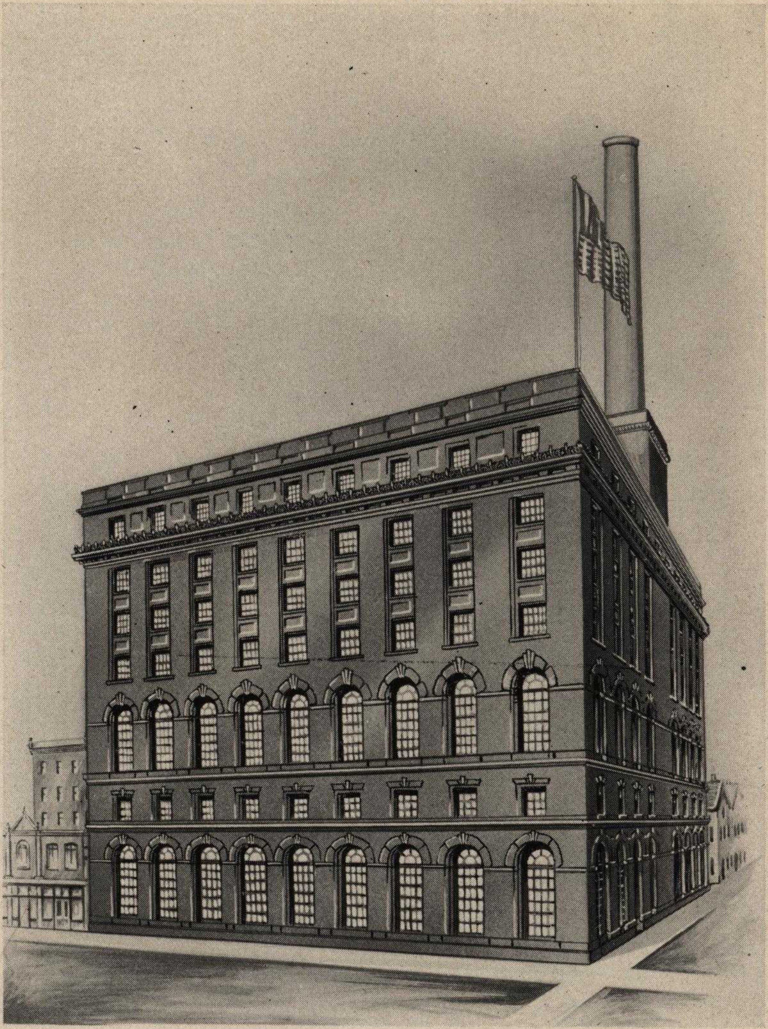
The new Frear building in Troy, N. Y., shows Lupton fire-proof hollow-metal Windows of special design. Note the diamond-pane windows in bridge connecting the two stores.



EDGAR V. SEELER, Architect DOYLE & DOAK, Builders

New building of The Evening Bulletin, Philadelphia.

A fine type of the modern newspaper building. All window-openings protected from fire with THE LUPTON WINDOW.



ROGERS & MACFARLANE, Architects, Detroit, Mich.

Murphy Power House, Detroit.

This plant, the vital heart of a city's power and light, has its window-openings protected from fire by The Lupton fire-proof hollow-metal Window.

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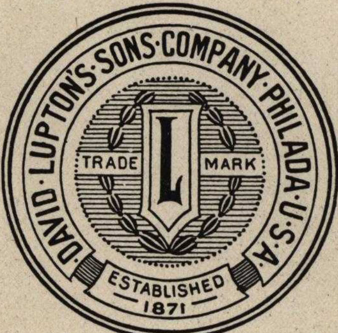
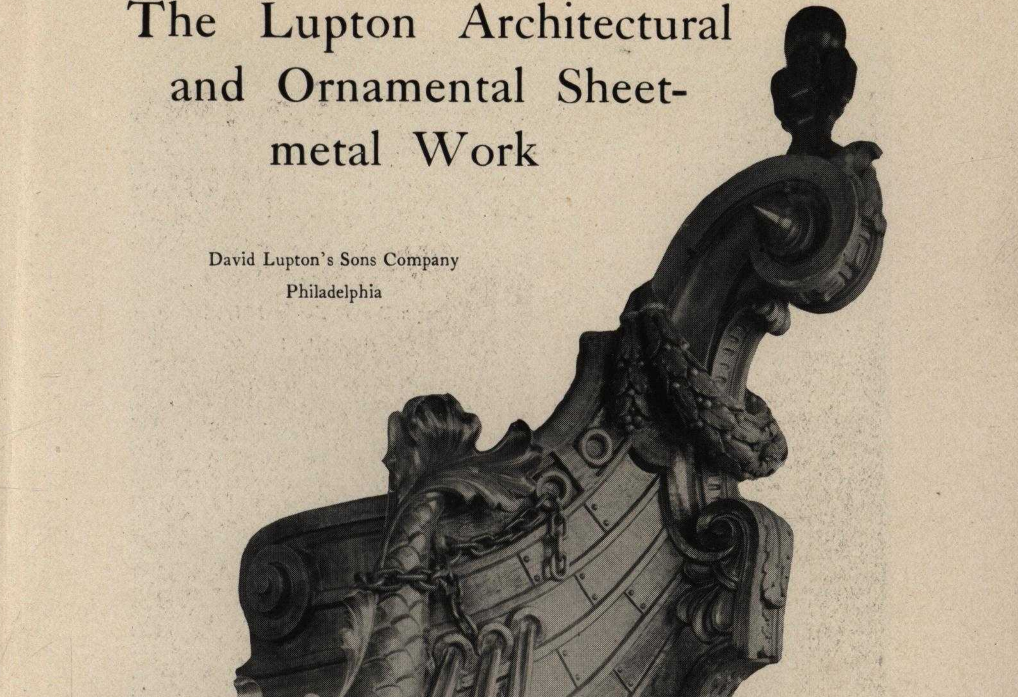
The installations herein illustrated serve to show the wide range in character of structures in which Lupton window-frames and sashes are employed.

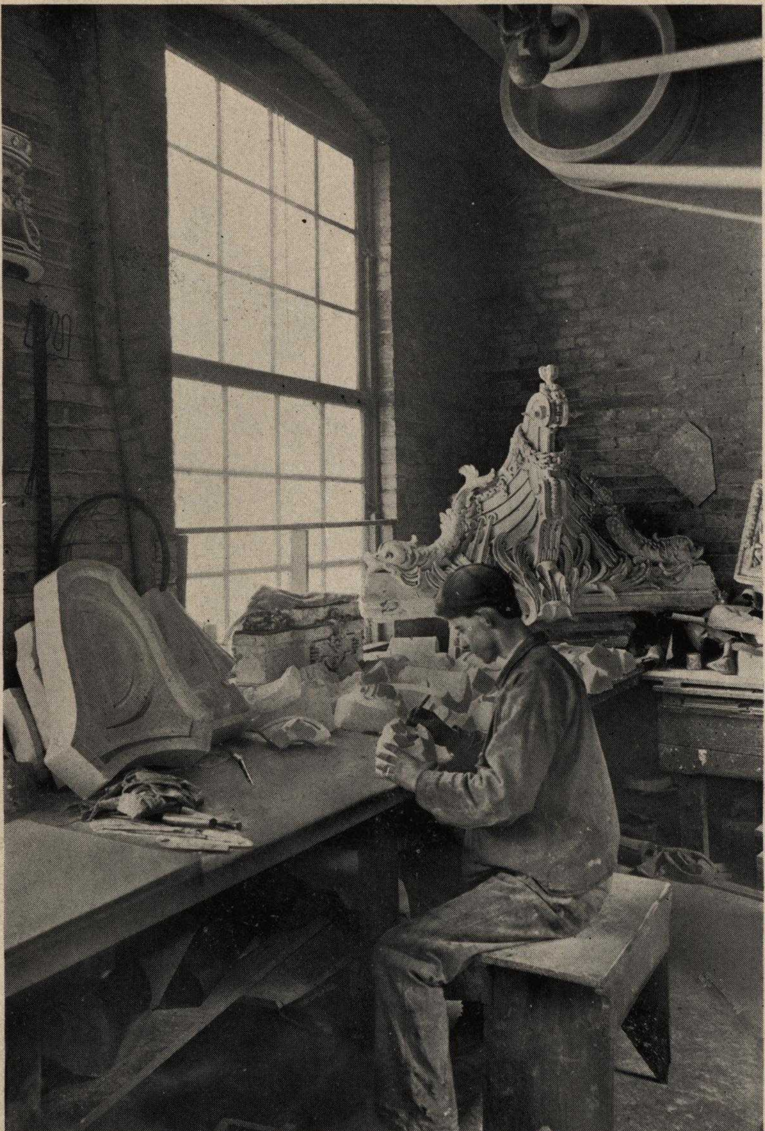

DAVID · LUPTON'S · SONS · COMPANY · PHILADA · U · S · A ·
TRADE
L
MARK
ESTABLISHED
1871

# The Lupton Architectural and Ornamental Sheet-metal Work

David Lupton's Sons Company
Philadelphia



Prow of Viking Ship, for Erie Railroad Ferry House, Twenty-third Street, New York. Design by K. M. Murchison, Jr., and L. R. Metcalfe, Associated Architects, New York. Done in copper at The Lupton Works.



View in the Modeling Shop of The Lupton Works, showing the original plaster model of the Prow of Viking Ship, illustrated on the previous page.

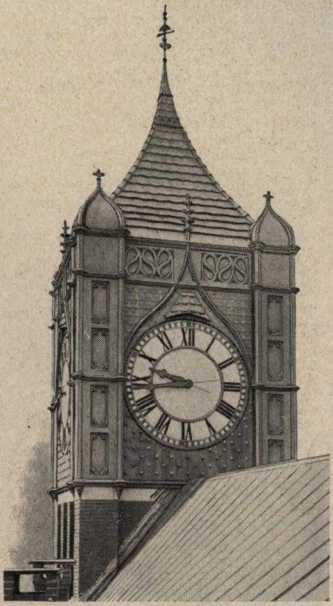
# The Lupton Works

is equipped for the construction of architectural sheet-metal work without limit in kind or design.

Estimates on special work will be furnished promptly. Drawings may be sent by express, or otherwise, at our expense. Lupton material and workmanship are guaranteed strictly first-class.

Prices are quoted for *galvanized* iron, unless otherwise stated.

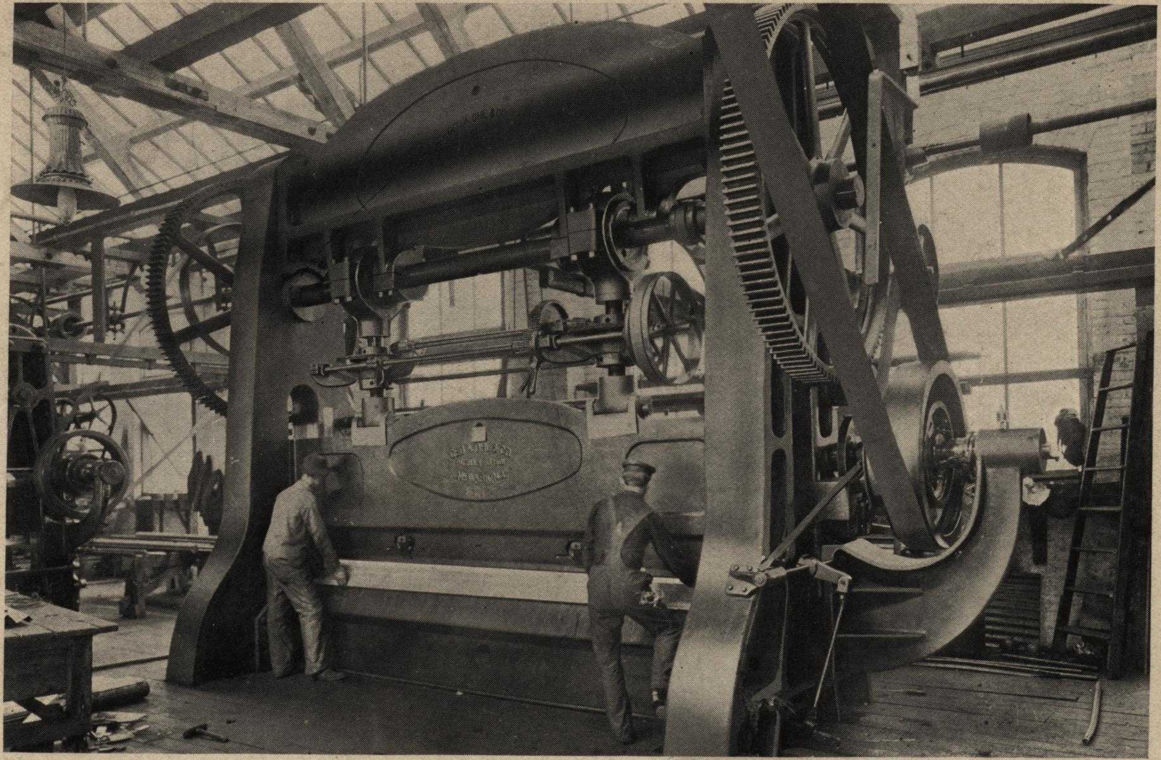
Lupton facilities for rapid production are unsurpassed. Prompt deliveries can be relied on.



Copper clock tower, John B. Stetson Building, Philadelphia. Erected 1890. No repairs have been necessary.

David Lupton's Sons Company

New York Philadelphia Detroit



The giant window press of The Lupton Works. Largest in the world. 90,000 pounds. 157 inches between housings.

IRELAND, PHILADELPHIA